

What is claimed is:

1. A heater apparatus for heating fluid, the heater apparatus comprising:
 - a thermally conductive mass;
 - heating means, insert molded in contact with the thermally conductive mass, for imparting heat to the thermally conductive mass; and
 - a fluid flow path formed in the mass between an inlet and an outlet, the fluid flow path coupled in heat transfer relation to the heating means so that fluid in the fluid flow path absorbs heat from the thermally conductive mass, the fluid flow path open to the exterior of the thermally conductive mass;
2. The heater apparatus of claim 1 further comprising:
 - control means, connected to the heating means, for activating the heating means.
3. The heater apparatus of claim 1 wherein the control means further comprises:
 - a printed circuit board.
4. The heater apparatus of claim 1 wherein the control means further comprises:
 - temperature sensor means, coupled to the control means, for generating an output signal proportional to the temperature of the thermally conductive mass.
5. The heater apparatus of claim 1 wherein the fluid expansion means comprises:
 - a closure having an enlarged portion defining a hollow interior chamber overlaying the open ends of the fluid flow channels in the thermally conductive mass;
6. The heater apparatus of claim 1 wherein the fluid flow path comprises:

a first flow path portion extending across one surface of the thermally conductive mass; and

a second flow path portion extending across an opposed surface of the thermally conductive mass, the first and second flow path portions disposed in fluid flow communication.

7. The heater apparatus of claim 8 wherein the first and second flow path portions are disposed in fluid flow communication substantially at the center of the thermally conductive mass.

8. The heater apparatus of claim 1 wherein the heating means comprises:

at least one heater element mounted in the mass.

9. The heater apparatus of claim 8 wherein the heating means is in direct contact with the thermally conductive mass over a substantial portion of its outer surface.

10. The heater apparatus of claim 1 wherein the heating means comprises:

a plurality of heater elements mounted in the mass.

11. The heater apparatus of claim 11 further comprising:
a controller for controlling the activation of each of the heater elements.

12. The heater apparatus of claim 1 further comprising:
a closure fixed to one surface of the mass; and
seal means for fluidically sealing the thermally conductive mass to the closure.

13. The heater apparatus of claim 12 wherein the seal means comprises:

an O-ring disposed between the peripheral portions of the closure and the thermally conductive mass.

14 The heater apparatus of claim 1 further comprising:

an electrical ground member electrically connected to the heating means, the ground member including a terminal and a plate electrically connected to the terminal and to the heating means.

15. A method for heating fluid comprising the steps of:

providing a thermally conductive mass having at least one fluid flow path extending therethrough; and

insert molding a heater means in the thermally conductive mass, with a substantial portion of the heater means in contact with the mass.

16. The method of claim 15 further comprising the step of:

providing a ground terminal in electrical contact with the at least one heater element.

17. The method of claim 15 wherein the step of providing a

thermally conductive mass further comprises the step of:

casting the mass using a sub-liquidous temperature material.

18. A method for heating fluid comprising the steps of:

providing a thermally conductive mass having at least one fluid flow path extending therethrough; and

insert molding a heater means in the thermally conductive mass, with a substantial portion of the heater means in contact with the mass; and

fluidically coupling a fluid inlet to one end of the fluid flow path and a fluid outlet to the other end of the fluid flow path wherein fluid in the fluid flow path

absorbs heat from the thermally conductive mass, the heat imparted to the mass by the at least one heater element.